

Asian Currency and Financial Crises: Lessons from Vulnerability, Crisis, and Collapse

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1. INTRODUCTION

THE East Asian financial crisis has been a truly extraordinary event. Suddenly the most rapidly growing and successful economies in the world were plunged into deep crisis. Still, a year on, the events are not well understood. The present paper represents an attempt to disentangle:

- (i) the role of 'vulnerability' in what happened;
- (ii) the interconnection between the currency crises and the financial crises;
- (iii) why currency and financial crises turned into currency and financial collapse;
- (iv) what needs to be done, subsequent to this collapse.

We have written this paper because we are not satisfied with the overall accounts which are so far available. Of these, three stand out: accounts by Corsetti, Pesenti and Roubini (1998), Radelet and Sachs (1998), and Bahttacharya, Claessens, Ghosh, Hernandez and Alba (1998). Yet in all of these an overall analytic account remains elusive. Corsetti et al. believe that there is a choice between fundamentals-based explanations (citing Krugman, 1998a) and financial-panic-based explanations (citing Radelet and Sachs, 1998); they opt for the former. Bahttacharya et al., mobilising the ample research resources of the World Bank,

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provide a very helpful overall descriptive account of what happened. Conceptually they focus on a contrast between two rather different categories of explanation: 'underlying structural weaknesses and macroeconomic policies such that crisis was inevitable' versus 'a sudden run on the currency which led to a shift to a worse equilibrium' (p. 12), and they are inclined to give credence to both. Radelet and Sachs (1998) list no fewer than five possible ways of understanding the crisis: as a macroeconomic-policy induced crisis (which includes currency collapse as a category); as financial panic, as bubble collapse, as moral hazard crisis, and as a 'disorderly workout'. Although the authors come down firmly on the side of the financial panic story, they also argue that all of the crisis features 'may in fact be intertwined in any particular historical episode'. Yet they never give a clear indication of how this 'intertwining' is meant to work.

This lack of a clear framework is revealed by the following quotation from the conclusion (p. 30) of the Radelet and Sachs paper. This appears to beg as many questions as it answers.

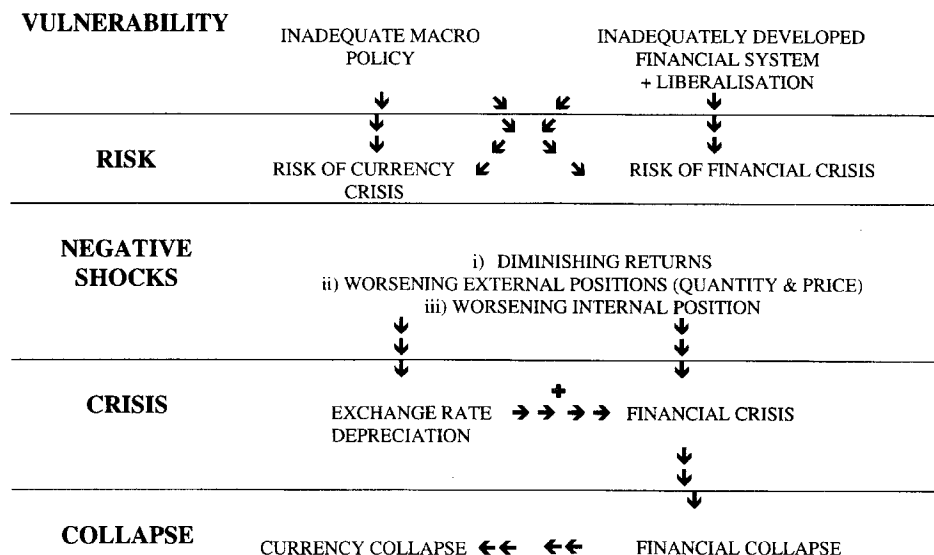
In our interpretation, the East Asian crisis resulted from vulnerability to financial panic that arose from certain emerging weaknesses in these economies (especially growing short-term debt), combined with a series of policy mis-steps and accidents that triggered the panic. Since we view the crisis as a case of multiple equilibrium, our hypothesis is that the worst of the crisis could have been largely avoided with relatively moderate adjustments and appropriate policy changes. Explanations that attribute the entire massive contraction to the inevitable consequences of deep flaws in the Asian economies such as Asian 'crony capitalism' seem to us to be strongly overstated. Without question, there were macroeconomic imbalances, weak financial institutions, widespread corruption, and inadequate legal foundations in each of the affected countries. These problems needed attention and correction, and they clearly contributed to the vulnerability of the Asian economies. However, most of these problems had been well known for years, and the Asian-5 countries were able to attract \$211 billion of capital inflows between 1994 and 1996, under widely known conditions of Asian capitalism. To attribute the crisis fully to fundamental flaws in the pre-crisis system is to judge that the global financial system is prone to sheer folly, or somehow expected to avoid losses despite the fundamental flaws. Paul Krugman's explanation of the crisis that investors knew that their investments were to weak borrowers, but felt protected by explicit and implicit guarantees also seems to us to be only a partial explanation ... Moreover, the actual market participants, by their statements and actions (e.g., decisions on credit ratings), while recognizing the flaws in these economies, simply didn't foresee a crisis, with or without bailouts. It is difficult, therefore, to make the case that a crisis of this depth and magnitude was simply an accident waiting to happen.

In this paper we seek to ask, as precisely as possible: why did both currency and financial crises happen? And why did crisis turn into complete collapse?

Our preferred explanation is set out schematically in Figure 1. In brief, it runs as follows:

- (i) Vulnerability to currency crisis was created by the boom and bust which resulted from liberalisation in the presence of a monetary policy regime based on *pegged exchange rates*. Vulnerability to financial crisis was created by liberalisation in the presence of a bank-based financial regime

FIGURE 1



which contained *implicit promises* to bail out the financial system if its balance sheet deteriorated. These vulnerabilities were interconnected.

- (ii) Negative shocks precipitated currency devaluation in the face of the vulnerability to currency crisis. There are some reasons to call this devaluation a 'currency crisis', but only in the sense that the ERM 'crisis' was a crisis — it need not have been a collapse. The same series of negative shocks imposed significant losses on the financial system which, because of vulnerability to financial crisis, triggered obligations for the government to bail out the financial sector. There are some reasons to call this a 'financial crisis', but this bailout could have been manageable and need not have provoked collapse.
- (iii) The critical feature which led to 'collapse' was — we argue — the fact that currency depreciation led to a worsening of the financial crisis. This was because of the particular feature to which the fixed exchange rate regime had led — massive unhedged borrowing in foreign currency. Financial collapse resulted when the currency devaluation was sufficiently large that those who had lent to the financial system came to believe that government guarantees to it could not be honoured. This triggered fears of sovereign insolvency, which in turn led to currency collapse.

Our explanation thus argues that both types of vulnerability were important. It also claims that collapse emerged as a result of the interaction of currency crisis and financial crisis.

Sections 2 and 3 discuss the implications of this analysis for policy.

2. TWO KINDS OF VULNERABILITY

We believe that vulnerability to crisis was created in two different ways, both a direct result of the 'miracle' boom period, and both a consequence of insufficient institutional development in the Asia Pacific region during that period. The first kind of vulnerability was created by the continuation into the era of liberalisation of a monetary policy based on fixed exchange rates. The second kind of vulnerability was created by the continuation, into the era of liberalisation, of a financial system containing implicit guarantees.

a. Vulnerability Created by Inadequate Macroeconomic Policy

Vulnerability was created by liberalisation of both trade and finance in the presence of a monetary policy regime based on pegged exchange rates.

A paper on Thailand published by the IMF in 1990 (Robinson et al., 1990) clearly described how Thailand's macroeconomic framework up until the end of the 1980s was jointly based upon a fixed nominal exchange rate — to provide the necessary nominal anchor — and fiscal prudence — to make room for its export-led expansion. Such a strategy had served Thailand very well as the basis for its behaviour which — until the early 1990s had been regarded as miraculous. Praise for this strategy was strongly echoed in a Fund paper published *as late as December 1996* (Kochar et al., 1996).

Yet it now appears that this macroeconomic strategy was entirely inadequate for the 1990s. In our view this strategy, which had served the country so well in the past, ceased to do so for two reasons.

The first is well known. The textbook Mundell-Fleming model shows that the trilogy of fixed exchange rates, autonomous national monetary policy, and open international capital markets is inconsistent.¹ What had happened in the decade between 1985 and 1995 was the opening of Thai capital markets to capital inflows. Nevertheless, the Thai authorities tried to dampen the boom in the first part of the 1990s by raising interest rates, even though the Thai baht was pegged to the dollar. The effect was to stimulate capital inflow, as Thai companies and banks borrowed abroad at lower dollar interest rates, and to leave the economy with a large outstanding stock of unhedged foreign debt, without succeeding in dampening the boom in the economy. Such policy may even have fuelled the boom: with credit constraints within the domestic economy, higher interest rates

¹ Many other countries have failed, before the recent experience in Asia, to learn this lesson. For example, monetary policy in the United Kingdom in the late 1980s and early 1990s contained contradictions of a very similar kind. An attempt was made both to control inflation and to peg the exchange rate at a low level in the mid 1980s. Then an attempt was made both to promote a recovery from recession and to maintain a fixed exchange rate within the ERM link in the early 1990s. Both ended in fiasco.

on domestic credit actually encouraged financial intermediaries to borrow abroad and to increase the supply of lending.² Similar errors appear to have been made in Indonesian and Korean macroeconomic policy, although to a lesser extent. It appears that policy authorities were continuing to use an approach to monetary policy which was only appropriate to the earlier period of much lower capital mobility.

The second reason is less well understood and is to do with fiscal policy. In Thailand the fiscal stance appeared — by conventional deficit measures — to be very tight. A budgetary law — which constrained any year's fiscal expenditure to within a small margin above the previous year's tax revenue — prevented the emergence of fiscal deficits and from the late 1980s produced small surpluses of two or three per cent of GDP because revenue was growing so rapidly. (See Warr and Nidhiprabha, 1996.) Yet fiscal balance — or even surpluses of this size — may be an insufficiently restrictive policy when a country experiences a large boom, especially if monetary policy is immobilised by a fixed exchange rate.

The experience of Thailand and of other Asian countries in the past decade has shown that a large boom is precisely what one would expect at a time of liberalisation.³ Such countries can be initially characterised as capital-scarce, low-wage economies in which the risk-adjusted productivity of capital is initially low, even although capital is scarce. As a result, returns to investment are low, and investment low. But reforming and opening changes this. The process involves putting in place sound macroeconomic policies, which provide a guarantee of stability. This reduces the risk premium on investment.⁴ Furthermore, the process of trade liberalisation can lead to an increase in the rate of return on capital — even though the economy specialises in exports of labour intensive manufactures — as a result of achieving economies of scale in production for world markets, and as a result of technology transfer into the liberalising economy. And finally, the opening of the financial sector to international capital flows then means that this investment, which is now less risky and more profitable, can be financed from abroad. Thus a liberalising economy is likely to experience a large investment boom. If this investment boom causes an increase in stock market valuations, it can easily induce a 'companion' consumption boom, as consumers who are more wealthy spend some of their gains. This boom is the particular problem with which macroeconomic management has to deal in an emerging economy.

² See Dooley (1994).

³ Richard Portes and the second author of this paper argued strongly, in a paper written in 1996 and published in early 1997, that this was the lesson to learn from the Mexican experience of 1995 (Portes and Vines, 1997). Jeffrey Sachs had been saying this since immediately after the Mexico crisis.

⁴ McKibbin (1994) estimated the implicit reduction in the risk premium when Mexico joined NAFTA and showed that it was large enough to cause a significant boom.

It is our view that the inflexibility of monetary policy imposed by a fixed exchange rate can, in these circumstances, be particularly dangerous if fiscal policy is inadequately contractionary.

The way in which this can lead to macroeconomic vulnerability has been documented by Warr (1998) and Warr and Vines (1999) for the case of Thailand. Warr documents how the boom which preceded the crisis was not choked off by an appreciating exchange rate precisely because of the exchange rate peg. He then argues that the consequence of this boom was that cost price increases were unchecked, making the export sector increasingly uncompetitive. This is an intrinsically sequential story. It suggests that there will be an excessive investment boom — and perhaps also a consumption boom — in an initial phase under fixed exchange rates, and that the consequences of this boom will erode the profitability of the investment projects in a subsequent phase.⁵ At the time of writing we do not have hard evidence on how generally this argument applies in other Asian countries, but suspect that it does, at least in part.

With a commitment to a fixed exchange rate the difficulties which emerge in the period following the boom cannot be alleviated by means of subsequent currency depreciation if the value of the currency peg is to be maintained. In this subsequent phase the economy becomes vulnerable to a currency crisis, particularly in the face of exogenous shocks. Thus it is possible to say that the maintenance of a fixed exchange rate rendered the Asia Pacific economies vulnerable to a currency crisis in the face of any significant worsening of the external environment.

But notice that currency crisis could also be precipitated simply by the downturn which follows the ending of the boom itself, for example as the stock market falls. It is thus also possible to argue that the fixed exchange rate rendered these economies vulnerable to a process of boom and bust, in which the bust itself caused a currency crisis.

b. Vulnerability Created by an Inadequately Developed Financial System

Financial vulnerability was created by liberalisation of trade and finance in the presence of an unreformed financial system.

The previous financial system in Asia was designed for the channelling of domestic savings into investment and growth largely through the banking system. It appears that much of the investment was covered by guarantees, either implicit or explicit.⁶ The process of credit allocation appears to have involved extension

⁵ This sequential argument makes two realistic assumptions. The first of these is that wage and price adjustment lags behind output, with the dual implication that wage and price adjustment fails to choke off the boom in the first period, and that wages and rises rise so far in the second period as to throw the boom into reverse. The second assumption is that investors are not sufficiently forward-looking as to see what is coming and so damp investment in the first period.

⁶ Stiglitz (1996) discusses ways in which the system worked and cautions against forgetting just how well it worked.

of bank loans, often under state direction, the collateral for which often appears to have been little more than expected revenue growth, or even just the name of the borrower. Many firms were very highly geared, and banks were thus highly vulnerable to a revenue downturn; in aggregate the whole of the financial system was vulnerable to the risks of such a revenue downturn. In countries experiencing very rapid growth, the risks of such a downturn were probably heavily discounted. But — importantly here — it appears that the financial system was implicitly guaranteed against these risks, as a *quid pro quo* of its acceptance of state direction of finance. This was essentially a financial system in which corporate finance was managed through a guaranteed banking system with the purpose of channelling domestic credit to domestic firms.

As already noted in the previous section, liberalisation made it possible to finance externally, investment opportunities on which returns had increased and risks had fallen, thus facilitating an investment boom. The additional point here is that the guarantees of the old style financial system appear to have been extended to much of the foreign-financed investment. This had the implication that the stock of implicit guarantees to the financial system rose markedly. Accounts of what happened in the region suggest that financial intermediaries systematically downplayed the risks associated in the expansion of their balance sheets in this manner.

This is the problem to which Krugman (1998a) has drawn attention. He argues that the problem with such financial intermediaries — institutions whose liabilities were perceived as having an implicit government guarantee — is that they are subject to severe moral hazard problems. In his analysis such intermediaries will ‘almost always’ require a bailout, since competition pushes them to the point where they do not earn economic profits in any state of the world, and cover their costs only in the most favourable possible state.

For our purposes we need to say less than this, merely that continuation of this form of financial system created guarantees which, if optimistic expectations were not fulfilled, would need to be honoured.⁷ If the amount of these guarantees were to become too large then there was a risk that they could not be honoured.⁸ Economies then became vulnerable to the risk of financial collapse: losses to the asset side of the balance sheet of the financial system were so large that government guarantees were unable to cover them.

c. Interconnection between the Types of Vulnerability

It appears that these two forms of vulnerability were interconnected.

Inadequate macroeconomic policy increased the vulnerability of the economy to financial crisis, as well as to currency crisis. The fixed exchange rate system

⁷ It is quite difficult to disentangle moral hazard from over-optimism.

⁸ Or more precisely the risk was that governments would trade off the cost to them of honouring the guarantees against the cost of doing so and would choose the latter.

enabled borrowing in international currency with an implicit guarantee of a fixed exchange rate, which became particularly attractive when monetary policy erroneously attempted to combine a fixed exchange rate with higher domestic interest rates. This meant that there was a very large build-up of a stock of debt denominated in foreign currency. It thus appears that domestic financial intermediaries not only underestimated the risks to the asset side of their balance sheets, but also disregarded the risks involved to the liability side in borrowing from abroad. They appear to have believed that they were to a large extent guaranteed against *both* of these risks.

In addition, it appears that an inadequately developed financial system increased the vulnerability of the economy to currency crisis, as well as to financial crisis. The effect of the guarantees to the financial system was to unduly lower the risk premium on investment, further stimulating the investment boom discussed in the previous section with its consequent inflation. This further increased the subsequent vulnerability of the economy to currency crisis.

3. NEGATIVE SHOCKS

a. Diminishing Returns to Investment

Well before the signs of crisis in the East Asian economies there had been a debate about their productivity growth record and whether there had been 'too much' investment. Krugman (1994) likened their capital-intensive growth to that of the Soviet Union.⁹ He pointed out that 'if growth in East Asia has been primarily investment driven' then it was likely that 'capital piling up there is beginning to yield diminishing returns'.¹⁰ Notice that such falls in the rate of

⁹ In this he was quoting the work of Allyn Young (1995).

¹⁰ That interpretation is challenged by (among others) Radelet and Sachs (1997). 'Good economic policies and a favourable economic structure raise the returns to capital and thereby stimulate rapid investments in capital. Without [these] ... the returns to capital would be much less, so that capital accumulation would be much lower, and overall growth would be much slower as a result.' However, they agree that 'If ... most ... growth is the result of capital accumulation ... growth will slow down as capital deepening takes place (that is, as the capital-labour ratio rises sharply in the economy) since capital deepening will be associated with a declining rate of return to new investments. This is in fact the case in East Asia: as capital accumulation has progressed, rates of return on capital have declined, suggesting that indeed both capital accumulation and growth will taper off in the future.' Radelet and Sachs (1997) cite OECD data that the 'rate of return on capital in Korea declined gradually from around 22 percent in the mid-1980s to about 14 percent in 1994. In Singapore, a comparable indicator — the rates of return on US foreign direct investment — fell from 27 percent in the late 1980s to 19 percent in the mid-1990s. In Hong Kong and Taipei, China rates of return fell from around 21 percent to 15 percent. While these declines do confirm the neoclassical prediction of declining returns to investment, and are consistent with the rapid accumulation of capital documented by Young ... the important point is that they are still well above the world-wide average returns on US foreign direct investment of 11 percent.'

return will not explain crisis, since response to them could have been smooth and gradual. But they do constitute a negative shock, albeit a slow-acting one.

b. Worsening External Position

Current account deficits had increased in all the countries except Singapore but the degree of problem varied. The only country with a really large deficit was Thailand (−8 per cent). Malaysia, at −6 per cent, had reversed a worsening trend. However, it is impossible to read much from ex-post current account deficits because it is not possible to determine whether these were the consequence of benign inward foreign direct investment, or high domestic absorption, or a negative external shock. In the face of this lack of conclusiveness about causality it is important to look for more direct signs of external weakness.

One explanation of this story notes that competitiveness, measured by real exchange rates, worsened in most countries. There are a number of possible reasons for this. It may have been a result of changes in nominal exchange rates, and in particular an appreciation of the dollar — to which most of these countries' currencies were pegged — relative to the yen. Or it may have been due to a fall in dollar export prices. Or it may actually have been due to rises in domestic costs and prices of the kinds discussed above. Also the evidence is itself inconclusive. Thus for many countries the amounts appear to have been small. (The only countries where competitiveness appeared to have declined by more than ten per cent from 1990 were Indonesia, Philippines and Hong Kong. In Singapore, Malaysia and Thailand the declines appear to have been close to ten per cent. Korea and Taiwan appear to have had virtually no decline.) However, these figures — which use relative prices in computing the real exchange rate — appear to miss the rise in domestic costs described above for Thailand (and there is a suspicion that they may do so for other countries too).

Other versions of the story seek more specific explanations. One looks to the weakness of the electronic market, perhaps due to large increases in supply from the countries under consideration. Another version of the negative shock story attributes it to market crowding as a result of increased exports from China. Here the idea is that, until the mid 1990s, China had internal difficulties (and perhaps also an overvalued exchange rate) which held back export expansion. The resolution of those difficulties (and the devaluation of the yuan in 1994) enabled China to increase exports of manufactures competitive to those produced in the Asian economies. This had effects equivalent to a negative productivity shock in the other Asian tigers, which faced falling quantity demand and/or a falling price for their exports. Yet another variety of this story notes the prolonged recession in Japan, and the shock caused by the devaluation of the yen. Japan acts not as an export competitor from these countries but as an import market, and so recession in Japan has acted as a significant export market shock for these countries.

Perhaps most persuasively, it does appear that almost all countries in the region experienced significant declines in both export revenues and in export volumes in 1996. (IMF, *World Economic Outlook*, October 1997, Figures 7 and 8.) This does appear to be significant evidence of a negative external shock in that year, although it does not discriminate as between the origins of this shock.

4. A STYLISTED ACCOUNT OF THE CRISES

a. Currency Crisis

(i) Thailand

Any account of the Asian crisis must begin with Thailand.¹¹ The most obvious place to start in an analysis of what happened in Thailand, in the face of the above-described vulnerability and negative shocks, is a second-generation currency crisis model of the kind found in Obstfeld (1986, 1991, 1994 and 1995), Ozkan and Sutherland (1993, 1994 and 1995), and Davies and Vines (1998).¹²

¹¹ All of the crisis countries appear to have problems which were to some extent similar; it may have been almost accidental as to which cracked first.

¹² The currency crisis literature descends from Krugman (1979). The original canonical Krugman model describes a balance of payments crisis in which a loss of foreign exchange reserves leads to a collapse of a pegged exchange rate and currency depreciation. This arises when domestic credit expansion by the central bank is inconsistent with the pegged exchange rate. The credit expansion results from the monetisation of budget deficits. Foreign exchange reserves fall gradually until the Central Bank is vulnerable to a sudden run, which exhausts the remaining reserves, and pushes the economy to a floating rate. This original Krugman model was a fundamentals model — the fundamental which caused the crisis is domestic credit.

Subsequent developments of this type of model (e.g. Masson, 1998) treat the fundamental which causes reserves to fall as a shock to exports hitting the trade balance. Such models can be generalised so as to have self-fulfilling possibilities. For example the Masson (1998) model also incorporates foreign indebtedness, which raises the possibility of a risk that reserves will run out, leading to a risk premium on this debt, a rise in the interest rate which must be paid on it, and so to a further fall in reserves and to an increased likelihood of crisis. Feedbacks of this kind are what enable these models to produce self-fulfilling crisis outcomes in which a switch from a non-crisis outcome to a crisis can happen independently of any change in the fundamentals.

The operation of these models depends fundamentally, however, on a reserve constraint. They are unable to answer the question — how can a crisis arise in a world of very high capital mobility? In the second-generation models due to Obstfeld, currency ‘crisis’ arises because of conflict between the macroeconomic policy objectives of government and the maintenance of a fixed exchange rate. Such models enable one to understand the kinds of problems which can arise with open international capital markets — when it is not the case that the government actually runs out of reserves. Instead, the models focus on the fact that a fixed exchange rate constitutes a constraint on macroeconomic policy which is abandoned when the constraint becomes too costly for policy makers to sustain it. For example, a negative shock to aggregate demand can cause a recession so deep that it is optimal for a government to depart from a fixed exchange rate even though it will lose credibility by doing so. Fear that a fixed currency peg will be abandoned can lead to a risk premium being attached to holding the currency with the consequence that interest rates rise, thus making the maintenance of a fixed exchange rate all the more costly. This feature can enable these models, too, to produce self-fulfilling crisis outcomes, in which a switch from a non-crisis outcome to a crisis can actually be induced by a rise in the risk premium associated with the possibility that this might happen.

The Thai economy appears to have been subject to a negative demand shock, due to a downturn in exports. For all countries this negative shock appears to have come partly from abroad, with the downturn in demand for electronics and in export markets more generally, the rise in the dollar to which the baht was pegged, the fall in demand from Japan, and the rise in the competition from China. But for Thailand in particular the negative shock also appears to have resulted from the rise in costs and prices which followed from the boom phase, which led to a rise in the real wages and an appreciation of the real exchange rate.

In the absence of an expansionary monetary policy, such a shock would have caused a recession. The government was committed to a fixed exchange rate, departure from which, through a more expansionary monetary policy, would have involved a loss of credibility. Nevertheless the depression of the economy by the negative shocks gave an incentive to devalue. Our argument is that the vulnerability of the economy — because of the already existing lack of competitiveness of the export sector — meant that the costs of holding onto the peg became too great.

As the crisis erupted in the summer of 1997, expectations of depreciation raised the interest rate consistent with open interest parity and made it more costly to defend the peg. Our argument is, again, that the vulnerability of the economy meant there was insufficient ability to withstand rising interest costs.

It is thus possible to argue that the early stages of the Thai crisis were quite similar in form to the ERM crisis of 1992, in which the 'crisis' led to a floating exchange rate, with the intention of achieving a controlled devaluation sufficient both to take the pressure off the export competing sector and to lead to a domestic recovery. It does appear that not to have devalued would have been very costly, even independently of any increase in the interest rate. As long as there are limits to the government's willingness to impose these costs on an already vulnerable export sector and domestic economy, one can argue that it was a rational choice to allow the currency to devalue.

We would make four observations on this account. First, it attributes the devaluation to the conflict between the macroeconomic policy objectives and negative shocks, in the presence of vulnerability. It does not attribute the devaluation to a shortage of reserves, or to a mismatch between reserves and short-term liabilities. The reason for this is that in a world of highly mobile capital it is not reserves which matter but private capital flows. It is always possible to induce these by a sufficiently high interest rate — the question is whether that becomes too costly. Our argument is that in a fragile economy, vulnerable as a consequence of the previous boom, the

government was not prepared to raise the interest rate sufficiently to defend the currency.¹³

Second, there does not appear to be a need to appeal to self-fulfilling-crisis (equals multiple equilibrium) ideas in order to explain Thailand's original devaluation. We can say that the devaluation was provoked by the external shocks imposed on an economy which was vulnerable because of its worsened cost position. It does not appear to be helpful to argue that if only the risk premium had not risen then the devaluation would not have happened.

Third, we have to ask would the authorities have devalued if they had known what was coming? Would not continuing on a fixed exchange rate have been preferable to unleashing the crisis which followed? It is implicit in this analysis that what the Thai authorities — and their IMF advisers — thought would be achieved by departing from the fixed exchange rate was the macroeconomic benefits of a modest depreciation. It does not appear that they understood that this might help to provoke a financial collapse.

Finally, we have to ask what determined the extent of the depreciation in the early stages of the currency crisis. We have to admit that there is no very good analysis in the theory of currency crisis of how far the currency devalues if the peg is abandoned. The Ozkan and Sutherland models referred to above suppose that if the currency devalues, the resulting devaluation will be real (i.e. the background to the model is one of absolute nominal stickiness) and that the extent of depreciation will be an amount sufficient to remove the negative effects of the demand shock. Most other analyses treat the extent of the resulting depreciation as exogenous. But it clearly depends on the nature of the policy regime. Once the devaluation came, there was great uncertainty about the ability of the Thai authorities to take the necessary corrective action even in the early stages of the crisis. In particular it was not clear what the new nominal anchor would be and thus what real depreciation would result from any particular nominal depreciation. This is consistent with the initial depreciation in the summer of 1997 being larger than was expected.

(ii) The other economies

In none of the other economies was overheating or macroeconomic vulnerability nearly as obvious as in the Thai economy. It thus appears to us

¹³ This is not to deny the fact that, as the crisis broke, the Thai authorities had exhausted their reserves and were unable to obtain access to sufficient foreign capital to continue to defend the currency. As a crisis breaks it may be rational for lenders to refuse to lend at almost any interest rate, because of the strong possibility that the currency will be devalued. Even if the government attempts to borrow in foreign currency in order to intervene, lenders to the government may perceive the near certainty of devaluation and the resulting capital loss which the government would face on its borrowing, and may begin to build such large probability of default into the risk premium as to make further borrowing impossible.

that one may well need to locate the onset of currency crisis in Korea, Indonesia, Malaysia and the Philippines in terms of contagion: an increasing risk premium leading to the costs of defending the exchange rate being more than those which were politically acceptable. For these economies, there does appear to be a need to appeal to self-fulfilling-currency crisis ideas in order to explain their initial devaluations. For these economies, it does appear to be possible to argue that if only the risk premium had not risen then the devaluation would not have happened.¹⁴

Again, for these other economies, we have to ask whether the authorities would have devalued if they had known what was coming. Here again it does not appear that they understood that allowing the currency to devalue might provoke financial collapse.

b. Financial Crisis

It appears that the negative shocks which led to currency crisis also led to a problem for the financial system. The negative shock, imposed upon an economy already vulnerable due to the rise in domestic costs and prices, reduced the value of the assets of the banking system, requiring government bailouts for the financial system. This led to financial crisis. It is our interpretation, but for one feature of the circumstances, all the Asia Pacific economies might have withstood the need for these bailouts without the financial crisis turning into a financial collapse.

The way in which collapse can arise has been analysed by Irwin and Vines (1998). Suppose that the government is subject to a ceiling on the amount of taxation that it can raise to cover bailouts. Then there is a risk that the government will be unable to cover the bailouts to the financial system which it has promised. This may lead to a risk premium being required in any lending to the financial system. That will increase the outgoings of the financial system and so increase the costs of the bailout. The higher is the risk premium the more costly will be the bailouts. This risk premium could, of itself, make it possible that bailouts which could otherwise be afforded can no longer be paid, and so make it more likely that the bailouts will not be honoured by the government. Self-fulfilling crises appear to be possible. All lenders require a risk premium not to withdraw their funds; this causes a rise in the cost of guarantees which means that only a proportion can be honoured whereas before they could be paid in full.

The situation is compounded by the possibility of panic, analysed by Corsetti, Pesenti and Roubini (1998). Consider the case in which the government could in fact raise the funds through taxation to cover its implicit guarantees, but not

¹⁴ Nevertheless, the same sorts of risks which we have described for Thailand existed in these other economies and all were vulnerable to the emergence of a big enough shock.

immediately, only over time. In this case collapse could be avoided, if the government were able to borrow to cover the guarantees. But panic is possible in which the short-term creditors of the financial system suddenly withdraw their loans, even though the guarantees could be met in the longer term. The problem occurs when short-term debts of the financial system exceed short-term assets which the government can immediately mobilise to pay off the guarantees; and when there is no lender of last resort to the government.

But, to repeat, it is our view that but for one feature, the problem of collapse could have been avoided.

5. COLLAPSE: THE EFFECT OF CURRENCY CRISIS ON FINANCIAL CRISIS

It is our argument that, in each of the Asia Pacific countries, it was the depreciation of the currency which led to financial collapse. This was a result of the particular feature, already noted, to which the fixed exchange rate regime had led: foreign currency liabilities as a result of massive unhedged borrowings in foreign currency. Devaluation increases the value of these liabilities. Financial collapse resulted when currency devaluations were sufficiently large that those who had lent to the financial system came to believe that government guarantees to the financial system could not be honoured. This triggered fears of sovereign insolvency.

This is our interpretation of how collapse first developed in Thailand. The devaluation of the baht in the middle of 1997 made the financial crisis worse by increasing the value of the outstanding obligations on dollar borrowings. As already noted, firms had built up large unhedged foreign borrowings in dollars. The larger the devaluation of the baht, the larger became the local currency value of these borrowings following the depreciation. As a consequence, depreciation increased the size of the required bailouts for the financial system. There came a point where these became too large, *or were thought to have become too large*. At this point, panic set in, followed by financial collapse.

It is clear that financial collapse can immediately lead to the currency falling further, and eventually to currency collapse. Once there is sovereign insolvency, then this is likely to lead to difficulty in controlling money expansion. This is likely to immediately lead to an expectation that any nominal anchor has been abandoned, which will immediately cause the currency to plummet. The mere *fear of sovereign insolvency* can give rise to the same outcome.

This process may well be unstable. The further the currency collapses the larger the bailout obligations of the government to the financial system become.

Notice that the effect of currency depreciation in this situation, in which there are large foreign borrowings denominated in foreign currency, appears to be inherently non-linear. If it is small enough it acts in an 'orthodox way' — helping

to relieve the macroeconomic downturn created by vulnerability and negative shocks. But if the devaluation is large enough to trigger bailouts which are large enough to trigger sovereign insolvency, *or the fear of this*, then the effect is clearly, and potentially massively, negative. It is possible to argue that the critical policy mistake in the handling of the crises was to allow a currency depreciation which became sufficiently large to broach this non-linear threshold. But our view is that it was not at all well understood where this threshold was. And for the Indonesian, Korean, Philippines and Malaysian economies hit by contagion it became almost impossible to prevent degrees of currency depreciation which, *ex-post*, appear to have breached this threshold.

This sequential story is how we interpret what happened not only in Thailand, but in all of the crisis-hit Asia Pacific countries.

We have some circumstantial evidence in favour of this interpretation for Korea, as a result of private conversations with one of the major rating agencies. These have suggested to us that in rating, for example, Korean banks, rating agencies knew that the banks were in financial difficulty but did not downgrade ratings because they still regarded the government commitment to bail out banks as firm. But in making this judgement they took into account the growing cost of the bailouts only so far as it concerned the cost of injecting enough capital to shore up the banks' adequacy ratios. This they considered to be well within the government's budget capacity. It appears that if the rating agencies had been aware of the possibility of a large currency depreciation and had had to factor in the cost to the government of honouring all of the banks' foreign liabilities in depreciated currencies then they would have considered that the budget deficit could not have stood that. That binding budget constraint would, it appears, have led to a revision of their estimate of the likelihood of support for the banks and a consequent down-grading of bank ratings.

The above argument suggests the following tentative hypothesis about the Asian crisis. Estimates of the financial fragility of the banking sector in the absence of (before) the currency crisis appear not to have been enough to trigger a crisis. Markets (or at least the rating agencies which supply them with information) do appear to calculate the probabilities of banks' rescue and consider government budget constraints important in that. These probabilities change when budget constraints change. Estimates of sovereign risk may well take into account the likelihood of bank failure, but in this case it appears that the currency crisis had to come first before the failures became sufficiently large as to threaten sovereign insolvency and create financial collapse. We might be able to assume that the style of analysis was similar in the markets themselves. Information about how one aspect of crisis — the currency crisis — is likely to affect another aspect of crisis — the financial crisis — may not have been perfect, and understanding this may play a crucial role in explaining how the crisis developed.

6. IMPLICATIONS FOR CRISIS MANAGEMENT

The Asian crisis has posed completely new problems in crisis management. Our analysis has been that: (i) crisis became collapse because financial guarantees to the banking system became larger than the government could honour, or because this was feared to be the case; (ii) a major reason for this was because of large foreign country obligations of the banking system which currency devaluation caused to become unexpectedly onerous.

Suddenly the crises have caused a large number of losses; debts which cannot be repaid immediately, and which may never be repayable. These initially fell upon the banks, and have (explicitly and implicitly) become partly or even completely socialised, as a result of the state guarantees offered to the banking system. The crucial task of crisis management is to allocate these wealth losses.

This task makes these crises with open international capital markets very different from the orthodox balance of payments crisis with which the International Monetary Fund is used to dealing, where the problems are those of excess domestic absorption and a lack of national competitiveness. For those 'orthodox' crises the correct remedies are tight fiscal and monetary policies to curb the excess absorption, and to steer the exchange rate to the appropriate, modest, level of depreciation required for expenditure switching so as to promote net exports. But these orthodox remedies do not address the problem of allocating wealth losses, and they may have actually made the problems worse. (See Radelet and Sachs, 1998; and Stiglitz, 1998.) Tight monetary policies will reduce, not improve, the creditworthiness of indebted firms. And fiscal contraction, by exacerbating the downturn in the face of panic, causes firms' revenues to fall. The Fund has replied that halting and reversing currency collapse is a precondition of crisis resolution, and that traditional policies are essential for that purpose because there is no effective alternative. (See the discussion in Chote, 1998.) Many have nevertheless argued that urging interest rates of 25 per cent in Thailand were excessive when inflation had risen very little, and that interest rates were excessively tightened in Korea.¹⁵ It

¹⁵ For the 'interest rate defence' to be well managed it is important *both* to pursue an appropriate nominal anchor and to make the strategy clear publicly. Both of these requirements appear not to have been met. The Fund's strategy seems to have been to prevent overly rapid inflation in the CPI. But when the nominal exchange rate has fallen steeply this is inappropriate — the aim should be to prevent excess inflation in the prices of non-traded goods. In the crisis economies prices of non-traded goods have hardly risen, even in the face of enormous falls in the nominal exchange rate, and large rises in the CPI. This means that the extraordinary levels of nominal interest rates have also corresponded to extraordinarily high real interest rates, when measured using non-traded goods prices. (We are grateful to Ross Garnaut for drawing this point to our attention.) Furthermore, the strategy has not been clear enough for market participants to be able to determine what it implies — namely that the massive nominal exchange rate depreciations involve such large real depreciations that it is intended that they should be reversed. If this really had been made clear, defence of the currencies would, it can be argued, have been much more successful, at much lower cost.

does also appear that the fiscal tightening required in the IMF packages was excessive.¹⁶

There are two types of problems in allocating wealth losses. Are the main outstanding creditors foreign, and, if so, how are they to be treated? Are there also outstanding domestic creditors, and if so how are they to be treated?

a. Sovereign Debt Crises

If, in the period after financial collapse, the majority of the remaining debts are sovereign debts to foreign creditors, then the difficulty of allocating wealth losses depends on whether all of the debts are going to be repaid. What is required to repay them is to make domestic absorption fall below domestic income, by raising taxes.

There are two cases, both illustrated by earlier crisis episodes.

(i) The 'Mexico Solution'

In this scenario foreign creditors are repaid, and taxpayers meet the bill. This 'Mexico Solution' can be quick. If the creditors are indeed to be repaid, then there will be no sovereign insolvency. All that is required is to organise liquidity financing, and to reassure international creditors that indeed all debts will be repaid in full, so that a continuing orderly rollover of debts can proceed. The role of the IMF in such circumstances is clear and circumscribed.

The task of crisis management is to provide sufficient liquidity to enable immediately outstanding debts to be rolled-over. In the Mexico crisis of 1995, Mexico received a \$17.8 billion stand-by programme (amounting to what was then an unprecedented 688 per cent of Mexico's quota in the IMF), in combination with \$20 billion from the US Stabilization Fund and \$10 billion from the G10. But this funding enabled Mexico's debts to be rolled over in full, and the loans are in the process of being paid in full. Mexico quickly regained access to private capital markets and economic growth has been resumed.

¹⁶ The case of Indonesia in early 1988 is salutary. The currency had fallen from 2,500 rupee to 4,000 to the dollar during the course of 1997. This degree of depreciation is similar to that which has emerged in Korea and Thailand. It appears that, after the mistakes made in handling the bank closures in November 1997, the authorities in conjunction with the IMF, were getting crisis management in hand towards the end of 1997. As we understand things, the critical next stage was the budget to be presented at the beginning of 1998. The IMF was calling for a small budget surplus, even in the face of the massive budgetary blowouts generated by the bailout obligations necessary to deal with the banking crisis, and even allowing for the downturn in economic activity. (That is, the Fund was calling for an ex-post surplus.) The domestic Indonesian team was unable to deliver sufficient budgetary tightening for this purpose, proposing instead a budget which would have produced a modest deficit of around one or two per cent of GDP. When the budget was presented in the first few days of 1998, the IMF and the Washington policy community, and international markets, all gave the proposed deficit a comprehensive thumbs down. This is what sent the rupee into free fall. Within days it had gone from 4,000 to the dollar to 17,000. (We are grateful to Ross Garnaut for discussion on this issue.)

When the Mexico crisis hit at the end of 1994 it was hailed as the first crisis of the 21st century, and everyone believed that a major task had been accomplished in dealing with it. But in retrospect solving the Mexican crisis looks to have been easy. This is because the debts were sovereign debts. The solution of deciding to honour these sovereign debts, and promising to raise the revenue to do so through taxation, looks, with three years of hindsight, to have been a very simple one to manage.

(ii) The Latin American debt crisis scenario

But such an outcome is not the inevitable consequence of a sovereign debt crisis. If the foreign debts are not to be repaid, then there are deep difficulties. A workout is required of the sovereign insolvency. The Latin American crisis of the 1980s showed this: rescheduling and partial default led to a problem which took ten years to solve — Latin America's 'lost decade'. The crisis greatly added to poverty and led to ten years of low investment. A full solution must involve a stay on payments to private creditors (whether the debtors are public sector or private sector), an injection of liquidity financing the short term, and an orderly writing down of debts. If all three parts of the package are not available then liquidity injection, from the IMF or anywhere else, will simply finance capital flight as creditors scramble to be first in maintaining what settlement of claims they can. Resolution of the Latin American debt crisis took so long both because of free-rider problems — each lender seeking to profit from concessions made by competitors — and because creditors held out for an injection of funding from the governments of advanced countries.

b. Sovereign and Banking Crises

(i) The 'Korean Solution'

If, in the period after financial collapse, there remain also domestic financial institutions with outstanding debts, then the difficulty of allocating wealth losses depends also on whether all of these debts are going to be repaid. If there is both a sovereign debt crisis and a financial crisis, there are two sets of issues to deal with, not just one. Will foreign creditors be repaid, and how will remaining domestic debts be dealt with?

We may call the Korean scenario the one in which foreign creditors are to be repaid in full. But this is not the end of the question — within the country there remains a need for a domestic debt workout. Are *all* of the outstanding losses of the financial system to be honoured? It is possible that all of these obligations will be met by a bailout which will be paid by taxpayers. In this case then what is necessary is that the government borrows if it cannot meet these obligations immediately. This is essentially what happened in the case of the savings and loan crisis in the US. But where this is not possible because the existing debts are

too large, then it appears that the government needs to assume some, *but not all*, of the debt. Bankruptcy procedures are needed to resolve the financial position of those heavily indebted parts of the financial system, and for recapitalisation of the surviving parts. The rescue package must involve a stay on payments to private creditors and an injection of liquidity financing in the short run and an orderly writing down of debts.

It appears that all of the above will be needed in Korea at present. Until this domestic crisis resolution really happens, it is not clear which firms and which banks are financially viable, and it is not clear which are attractive to foreigners to continue to own or to purchase through inward investment.¹⁷ Continuing capital inflow, the rolling-over of debts, and the resumption of investment and growth will not happen until decisive steps are taken to resolve these uncertainties.

Many in Korea now complain that they are ill-treated in that capital inflows have not resumed, even though the country has been scrupulous in honouring its foreign debts. However, the lesson of the Korean case is that the resolution of domestic debts is necessary also. This is difficult. The shutting of bankrupt chaebol, and the reorganisation of banks takes time. And yet a full resolution of the crisis awaits significant action on this score.

The resolution of the financial crisis and that of the currency crisis are interconnected. It is clear that it will be difficult to work out how much bankrupt firms are worth without having a clear idea where the Korean real exchange rate will need to settle, and this is still uncertain. Yet, this should be possible to clarify, at least in principle, once the desired time-profile for the repayment of foreign debt has been determined. Once that is known the necessary pattern of current account surpluses becomes reasonably clear.

(ii) The 'Indonesian Scenario'

In the final case to be described, foreign creditors are *not* to be repaid and bankruptcy and crisis resolution procedure is required domestically. This is by far the most difficult case to organise. As in the Latin American debt crisis, a full solution must involve a stay on payments to foreign creditors, an injection of liquidity financing in the short term, and an orderly writing down of debts. If all three parts of the package are not available then liquidity injection, from the IMF or anywhere else, will simply finance capital flight as creditors scramble to be first in maintaining what settlement of claims they can. But as in Korea, there also needs to be bankruptcy procedures to resolve the financial position of heavily indebted parts of the financial system that are saddled with unredeemable debts. It appears that the government needs to assume some, *but not all*, of the debt, and to take it upon itself the task to repay some, *but not all* of the debt owed

¹⁷ Krugman (1998b) fails to make this point.

to foreign creditors. What proportion of the loss will be taken by shareholders, domestic taxpayers, and foreign creditors' banks (and perhaps foreign taxpayers) becomes an extremely difficult bargaining problem. The resolution of this bargaining problem, with at least three sides, may take years. As well as the free-riding and hold-up problems which plagued the solution to the Latin American problem, lenders will be reluctant to initiate rescheduling because of fears that offering concessions to one debtor will encourage others to demand similar treatment.

Furthermore, it will be almost impossible to determine how much bankrupt firms are worth — and thus how to conduct bargaining about the repayment of foreign debt — without having a clear idea where the real exchange rate will need to settle. At the same time, that will be hard to know without having a clear idea of how the debt resolution process will proceed. In particular, the equilibrium real exchange rate will depend on how much of the foreign debt is to be honoured. This circularity adds a macroeconomic impediment to the debt resolution process, which may be just as significant as the free-riding, hold-up, and 'concession comparability' problems already described.

7. LESSONS FOR GLOBAL ECONOMIC INSTITUTIONS

a. Avoiding Macroeconomic Vulnerability: Macro Policy Design and Surveillance, and the IMF

The International Monetary Fund's surveillance of mechanisms has been found wanting by this crisis. Internal studies within the Fund have described how the IMF was drawing attention to macroeconomic imbalances in Thailand, but that it did not foresee the impending severity of the impending crisis. More seriously, the Fund was essentially caught unawares by the crisis in Korea. There are also tasks for the Fund in modernising its advice in policy design. Advising countries about the need for, and the way to achieve, central bank credibility and the management of macroeconomic policy with floating exchange rates so as to produce a stable low inflation environment is an enormous task. One has only to think for example about the enormous amount of intellectual energy which has been expended on just this task in Britain, New Zealand, Australia and other OECD countries.

b. Financial Restructuring and Surveillance, and the World Bank

There are enormous tasks ahead for the World Bank in helping countries to restructure financial systems in the face of this crisis, and also to design a transparent, properly regulated financial system which will curtail the kind of

risky speculative investments that this episode gave rise to. If the Bank is to become deeply involved in financial reform in this way, this presents a difficulty for its division of labour with the IMF. The Fund has been responsible for macroeconomics and the Bank for microeconomic development issues, but these demarcations are essentially blurred when dealing with the banking and financial sectors. One other way of attempting to make the division of labour is to suggest that the Fund deals with monitoring, surveillance and short-run crisis resolution whereas the Bank deals with financial reconstruction and longer term structural reform. But these tasks are interrelated. For example, in dealing with the Indonesian crisis the IMF was forced to take rapid action and closed 16 banks. But it took this action without being able to say whether those banks which remained open were candidates for closure in the longer-term reform process, and the result was widespread panic. There are suggestions that — because of the importance of sound financial systems to effective macroeconomic policy — all of the financial sector expertise of the Fund and the Bank should be concentrated in the Fund. This is unlikely — but much closer cooperation between the two institutions will be essential.¹⁸

c. Risk Management in the Financial Systems of Lending Countries

There are tasks ahead in risk management for the regulators of international banks in the lending countries, to discourage risky lending of the kind that international banks engaged in during the run-up to the Asian crisis. If, as it appears from both the earlier Mexican episode and the Asian crisis, banks will not take due care in the lending process, then it may be up to regulators to impose very significant risk weightings in lending to these markets so as to make lending more costly to these markets and discourage it. (See Fane, 1998.) Such moves would help to tip the balance in the composition of investment in emerging markets towards equity, which this crisis has shown to be necessary.

d. Crisis Management

Finally the crisis has thrown up the need for international institutions of crisis management, especially in the case where foreign creditors are not all to be repaid. There is a gap in international architecture here, as US Treasury Secretary Rubin has recently forcefully argued. At present it seems that the IMF is confined, of necessity, to the role of providing liquidity financing to debtor countries, as a quid pro quo for a guarantee that international debts will be honoured. This was the case in the Mexican crisis where the sovereign debts were dealt with and have been honoured by the Mexican taxpayer. It also appears to be

¹⁸ For a detailed discussion of these issues, see Gilbert, Powell and Vines (1999).

the likely outcome of the Korean crisis, where the Korean taxpayers will pick up the responsibility of servicing the debts of foreign banks. But when this is not possible, because the existing debts are too large, then a rescue package must involve a stay on payments to private creditors (whether the debtors are public sector or private sector), an injection of liquidity financing in the short-term and an orderly writing-down of the debts. If all three parts of the package are not available then liquidity injection from the IMF will simply finance capital flight, as creditors scramble to be first in obtaining what settlement of claims they can.

The IMF is now in a very difficult position. There are very significant obstacles — including serious legal ones — to organising the necessary workout process. And there is no clear agreement that the Fund is the right institution to oversee it, since the Fund would be required both to oversee the workout procedure and to advise and assist indebted countries. Nevertheless, some orderly workout seems essential, in order that a failure to repay in full does not lead to an extended period of debt deadlock, both in Indonesia, and in similar circumstances in the future.

If such a workout process is not established, then it will go on being possible to argue, as has been argued in the case of Korea, that repayment is a less bad outcome than deadlock. Significant moral hazard will then remain in the international system: lenders, continuing to point to the dire difficulties associated with debt deadlock, will continue to expect to be bailed out, and they will continue not to take sufficient care in lending. There is no doubt that the consequence of the Mexican rescue was to increase this kind of moral hazard in the international system. If a similar lesson is drawn from the Asian crisis — that satisfactory, speedy crisis resolution is available only if all international debts are honoured — then this will further worsen the moral hazard problem.

In these circumstances the IMF will come to be seen as a debt-collecting body. This cannot be good for the legitimacy of the IMF as an international institution.

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